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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/825,648	04/04/2001	Joseph Wytman	003481.P009D	9902

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EXAMINER
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MUTSCHLER, BRIAN L

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 05/01/2003

3

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/825,648

Applicant(s)

WYTMAN, JOSEPH

Examiner

Brian L. Mutschler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_      6) ☐ Other:

## **DETAILED ACTION**

### ***Comments***

1. In claim 17, the “method of processing a wafer” comprises the step of “processing the wafer utilizing the processing fluid”. Since “processing” a wafer utilizing a “processing fluid” can encompass a wide variety of processes including electroplating, electroless plating and various other deposition techniques including gas phase deposition, as well as other processes such as etching, degreasing or even washing with water, the scope of the term “processing” was assumed to be defined by the specification, which defines the processing step as an electroplating process or electropolishing step (please see page 13 of the present specification).
2. It is also noted that claim 17 does not actually require the tilting of the wafer, but merely limits the device used in the method to be capable of tilting the wafer to prevent or reduce leakage of the processing fluid.

### ***Specification***

3. The abstract of the disclosure is objected to because it does not adequately portray that which is disclosed. Since the instant application claims a method for processing wafers using the compliant wafer chuck, it is suggested that the abstract be amended to disclose the method being claimed. Correction is required. See MPEP § 608.01(b).
4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: METHOD OF PROCESSING WAFERS USING  
A COMPLIANT WAFER CHUCK.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaki et al. (U.S. Pat. No. 5,853,559) in view of Getchel et al. (U.S. Pat. No. 6,019,164).

Tamaki et al. disclose a method for processing semiconductor wafer substrates **6** by placing the wafer **6** on a flat base **9** and engaging the wafer **6** to the bottom of an electrolyte tank **1** (fig. 1; col. 4, lines 1-55). The electrolyte tank **1** has a tank body **8** with sleeve-like sidewalls and a seal **11** that contacts the edges of the wafer **6** forming an enclosed tank for containing the electrolyte solution (fig. 1). When the wafer **6** is in position for processing, the wafer **6** forms the floor of the tank, and the wafer **6** is then electroplated (fig. 1; col. 4, lines 1-55).

The method of Tamaki et al. differs from the instant invention because Tamaki et al. do not disclose the following:

- a. The wafer chuck having a base and an upper body in which the upper body is coupled to the base by a flexible coupling, and that tilting of the

wafer allows for a compliant engagement of the wafer and the sleeve, as recited in claim 17; and

- b. Raising at least one lift pin through the upper body to raise the wafer for removal of the wafer from the upper body, as recited in claim 18.

Regarding claims 17 and 18, Getchel et al. disclose a workpiece chuck for holding a semiconductor wafer, wherein the workpiece chuck has an upper support on which the wafer is mounted and a lower support which is mounted onto a base for supporting the chuck (col. 3, lines 38-63). The upper and lower supports are held together by a non-constraining attachment means, such as springs, which allows substantially continuous relative movement between layers of the chuck (col. 3, lines 38-63). The non-constraining attachment means allow the position of the wafer to be maintained throughout operation. Getchel et al. also teach the use of lift pins **710** that allows the wafer to be lifted off of the top surface of the chuck (col. 19, lines 26-30).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Tamaki et al. to use a chuck capable of continuous relative movement between the layers of the chuck as taught by Getchel et al. because using a chuck capable of movement between the layers allows the wafer to be maintained in a constant position. The seal **11** of Tamaki et al. and the chuck of Getchel et al., capable of continuous movement, would prevent or reduce leakage of the processing fluid.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Tamaki et al. to use lift pins to

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remove the wafer as taught by Getchel et al. because using lift pins simplifies the removal of the wafer by ejecting the wafer from the surface of the support.

7. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaki et al. (U.S. Pat. No. 5,853,559) in view of Getchel et al. (U.S. Pat. No. 6,019,164), as applied above to claims 17 and 18, and further in view of admissions of prior art made in the present disclosure.

Tamaki et al. and Getchel et al. describe a processing method having the limitations recited in claims 17 and 18 of the instant invention, as explained above in section 5.

The method described by Tamaki et al. and Getchel et al. differs from the instant invention because they do not disclose the following:

- a. Using the processing fluid to deposit copper material onto the wafer, as recited in claim 19; and
- b. Using the processing fluid to remove copper material from the wafer, as recited in claim 20.

The instant disclosure states, "The technique of electroplating and electropolishing materials, such as copper, are known in the art" (see page 13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method described by Tamaki et al. and Getchel et al. to use the processing fluid to deposit or remove copper because the instant disclosure states that such techniques are known in the art. It is further noted

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that Tamaki et al. disclose the process of electroplating, and it is also known that electroplating and electropolishing can be performed using the same apparatus by switching the connection of the electrodes at the power source.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (703) 305-0180. The examiner can normally be reached on Monday-Friday from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



NAM NGUYEN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

blm  
April 23, 2003